Role of capillary blood vessels and macrophages in follicular development and atresia

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The genetic and molecular mechanisms that control the development of capillary blood vessels during follicular development are beginning to be elucidated. Ovarian follicles contain and produce angiogenic factors that may act alone or in concert to regulate the process of thecal angiogenesis. These factors are ultimately controlled by endocrine, paracrine and autocrine regulation. A recent study indicated that vascular endothelial growth factor plays an important role in the process of thecal angiogenesis during follicular development. Moreover, we are developing a novel technology for the induction of follicular development using the technique of in vivo gene administration. In addition, a few selected follicles complete growth and development for ovulation, whereas most undergo a degenerative process known as atresia at some stage in their development. Follicular atresia is a key phenomenon by which the ovary eliminates follicles that will not ovulate. Recently, CD 44 on macrophages is recognized as a key molecule for phagocytosis of apoptotic cells in the atretic follicles. These findings may offer an innovative technique for enhanced induction of follicular development in the ovary, which may lead to prevention of infertility caused by ovarian dysfunction.

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